

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference WJN/P36148WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/GB2004/005253	International filing date (day/month/year) 15/12/2004	(Earliest) Priority Date (day/month/year) 15/12/2003
Applicant CAMBRIDGE UNIVERSITY TECHNICAL SERVICES LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box II).

3. ☐ Unity of invention is lacking (see Box III).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

VIDEO HOLOGRAPHIC APPARATUS AND METHOD

COPY

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB2004/005253

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

The invention relates to a method of and apparatus for displaying a holographically generated video image sequence having plural video frames. For each frame there is provided and computed (20) a respective sequential plurality of holograms. Each said sequential plurality of holograms of the plural video frames are sequentially displayed on a diffractive element (12) for viewing thereplay field thereof, and the noise variance of each frame is perceived as attenuated by averaging across said plurality of holograms.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2004/005253

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-9, 11-18, 22-24

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9,11-18,22-24

Object: a method and a device for displaying a holographically generated video sequence comprising a phase mask and a binary phase modulator and wherein each image serves as basis for the generation of a plurality of holograms that are sequentially reconstructed.

Advantage: reduce S/N ratio and allows 4 phase levels to be addressed with a binary phase modulator.

2. claims: 20,21,25,26,10,19

Object : a method for computing holograms wherein two holographic representations of the same image are generated with only one (time consuming) FFT transform of that image by taking the real and imaginary part thereof.

Advantage : two different holograms are generated with only one transform.

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G03H1/22 G03H1/32 G03H1/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G03H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 589 955 A (AMAKO ET AL) 31 December 1996 (1996-12-31) column 4, line 39 - column 10, line 66 column 14, line 35 - column 15, line 18; figures 1-4,8,14,18	1-5,9, 11-15
A	SATO K.: "Characteristics of kinoform by LCD and application to display the animated color 3D image" PRACTICAL HOLOGRAPHY VIII 7-9 FEB. 1994 SAN JOSE, CA, USA, vol. 2176, 1994, pages 42-49, XP002336940 Proceedings of the SPIE - The International Society for Optical Engineering USA ISSN: 0277-786X the whole document	1,11



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

21 July 2005

Date of mailing of the international search report

02.11.2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Noirard, P

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>FERRI L C: "Visualization of 3D information with digital holography using laser printers" COMPUTERS AND GRAPHICS, PERGAMON PRESS LTD. OXFORD, GB, vol. 25, no. 2, April 2001 (2001-04), pages 309-321, XP004232470 ISSN: 0097-8493 paragraph [03.2]; figure 1 -----</p>	4,14
A	<p>JUN AMAKO ET AL: "SPECKLE-NOISE REDUCTION ON KINOFORM RECONSTRUCTION USING A PHASE-ONLY SPATIAL LIGHT MODULATOR" APPLIED OPTICS, OPTICAL SOCIETY OF AMERICA, WASHINGTON, US, vol. 34, no. 17, 10 June 1995 (1995-06-10), pages 3165-3171, XP000505703 ISSN: 0003-6935 the whole document -----</p>	1,11

